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One of the recent policy concerns in the area of development is whether globalization really helps to improve standards of living in developing countries. International organizations advocate the merit of accessing the global economy via foreign direct investment. Anti-globalization movements do not necessarily agree with this view. Those opposing globalization argue that self-interested multinational companies exploit the resources of developing countries and impair development. Thus, for the purpose of long run economic growth, it may be better to protect domestic infant industries rather than rely on foreign capital.

This article considers a policy issue of whether enlarged markets would result from closer ties with foreign-owned multinational companies during the development process. Whereas the gains from free trade have been thoroughly explored in the trade literature, very few attempts have been made at proving the trade of multinational companies is a more effective growth engine than the trade of domestic companies. Recent empirical literature (Levine & Renelt, 1992; Harrison, 1996; Frankel & Romer, 1999) shows a positive relationship between trade and growth. This relationship is not sufficient, however, to conclude that multinational companies are advantageous. Trade openness is enhanced when domestic companies increase their transactions with foreign countries. The possible gains from the activities of multinational affiliates in developing countries have been explored in the following two areas. One is technology spillovers to domestic companies (Haddad & Harrison, 1993; Kokko, 1994; Aitken & Harrison, 1999; Blomström & Sjöholm, 1999). The other is wage spillovers to domestic companies (Aitken, Harrison, & Lipsey 1996; Feenstra & Hanson 1997); however, as Lipsey (2002) points out, little attention has been given to the effects of Foreign Direct Investment, henceforth FDI, on consumers in the literature.

This article relates two branches of the literature: trade openness and inward FDI (i.e., the presence of foreign affiliates in host countries). The possible gains of an open-door policy to the markets in developing countries by examining the effects of inward FDI on market size is investigated. For this purpose, two alternative industrial policies are compared. One policy would involve the promotion of a domestic company. The second policy would require the hosting of a foreign-owned multinational company.

The model falls among those found in the standard industrial organization literature on the interrelated markets (the seminal work of Spengler, 1950; Greenhut & Ohta, 1979; Tirole, 1988) and the more recent ones that

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appear in the literature on the taxation of multinational companies (Horst, 1971; Copithorne, 1971; Eden, 1985; Kant, 1990; Prusa, 1990; Gresik & Nelson, 1994; Stoughton & Talmor, 1994; Bond & Gresik, 1996). Specifically, a theoretical model is constructed by referring to the recent tax regulations concerning multinational companies (Elitzur & Mintz, 1996; Tomohara, 2004). Furthermore, the analysis focuses on the vertical model of a multinational company. The knowledge-capital model predicts the emergence of vertically integrated multinational companies when countries differ in relative factor endowments (Markusen et al., 1996; Markusen, 1997; Carr, Markusen & Maskus, 2001; Markusen & Maskus, 2002; Blonigen, Davies, & Head, 2003). Such differences in relative factor endowments between developing and developed countries are often observed.

Analysis reveals the possibility an open-door policy will improve the welfare of consumers through the increased trade of multinational companies. If the markets between a developed country and a developing country are interrelated through intra-firm trade by multinational companies, the developing country's domestic market becomes larger as the volume of trade increases. This is because a multinational company tries to maximize its global profits by exporting more goods to the host country. The multinational company creates new demand by providing goods at a lower price than a domestic company does, even if both companies have the same cost and production functions and, thus, face the same demand for the goods. The results of the analysis complement the previously recognized link between trade openness and economic growth. Furthermore, the results provide a theoretical foundation for the claim that an industrial policy encouraging the presence of foreign-owned multinational companies will enlarge the economy of host countries through trade promotion. It is concluded that industrial policy tied with foreign-owned multinational companies is a potential catalyst for enhancing the size of a domestic market, creating job opportunities, and inducing technology transfer. Therefore, policies encouraging the presence of foreign-owned multinational companies are effective engines of economic growth.

The next section describes a model for studying the effects of two previously mentioned industrial policies on the size of the market in a developing country. The difference in trade patterns under such policies clarifies the mechanisms through which trade by foreign multinational companies enlarges the size of the markets in comparison with the trade of domestic companies. Concluding remarks offer directions for future research.

Model

Consider the situation in which governments in developing countries have two alternative industrial policies for the development of their economies. One is protecting their infant domestic industries and/or promoting state-owned companies. The other is inducing foreign direct investment and encouraging the establishment of multinational companies in their countries. The two different market structures are compared and the effects of their different trade patterns on domestic market size are examined.

Foreign-Owned Multinational Monopoly

The markets across two countries are interrelated through an intra-firm transaction of a vertically integrated multinational company. The vertical model is the knowledge-capital model that predicts the emergence of vertically integrated multinational companies when countries differ in relative factor endowments. The knowledge-capital model explains why the different patterns of multinational

companies evolve endogenously. Consider the relationship between two countries: a developing country that hosts multinational companies and a developed country where the parents of multinational companies are based. The differences in relative factor endowments between the two countries are often observed. The model says that multinational activities are motivated by the differences in relative endowments since vertically integrated multinational companies are likely to emerge in order to exploit the differences.

Trade within a firm is modeled as a manufacturing process from a parent factory in an upstream location to assembly factories located in the destination market (Helpman, 1984; Helpman & Krugman, 1985). A typical example is a parent company in the developed country producing and exporting intermediate goods that are further assembled or manufactured by a subsidiary in the developing country. Final goods are sold in the developing country's market.

Following the traditional vertical integration literature, the intra-firm transaction is characterized to be a fixed-coefficient production function (Greenhut & Ohta, 1979). Let $q > 0$ be the quantity of the intermediate goods produced by the multinational parent in the developed country, and $Q > 0$ be the quantity of the final goods processed by the subsidiary in the developing country. The production function is $Q = \alpha q$, where α is a positive constant, assuming that the amount of a local input required for the production is proportional to q. We use the special case of $\alpha = 1$, as is commonly observed in the transfer pricing literature. With the proper choice of units, one unit of the intermediate goods is required to produce one unit of the final good.

The transfer price of the intra-firm trade is regulated as in the current tax system. The transfer price is denoted as $\overline{\theta} = (1+k)c_h$ with a positive constant mark-up rate k. The mark-up is an advanced agreement among a multinational company and two governments. It is determined as if the intra-firm transaction took place between non-associated parties in the market. This is so called the Bilateral Advanced Pricing Agreement (BAPA) case, in which tax authorities in the two countries agree to use the same arm's length price so as to eliminate the risk of double taxation. Recent work in this area (Elitzur & Mintz, 1996; Tomohara, 2004) considers the Advanced Pricing Agreement case using a similar (or the same) analytical framework.[1] In practice, the mark up ratio is usually decided by referring to market conditions at the industry level. The mark-up rate guarantees that the positive profits will be allocated to each country under the current tax system (where the source of taxation rights relies on national sovereignty).

The company is assumed to have a monopoly on its differentiated goods in the host country. One interpretation of this assumption is that the potential size of the market is not large enough due to the scale economy of the industries.[2] Let the inverse demand function for final goods in the host market be $p = p(q)$, where p is the price of the final goods. The price is assumed to be continuous and twice differentiable, strictly monotonically decreasing, and concave in the quantity of output.

The factor markets are characterized to be competitive (either in the developed or developing country) because many local companies provide non-differentiated parts necessary for production. A simple linear cost function $C_i = c_i q$, where c_i is a positive constant marginal cost in location i is used. The location is denoted as $i = h$ for the developed country and $i = f$ for the developing country.

A multinational company chooses output (which impacts the volume of trade) to maximize after-tax profits of the group. Global profit maximization is assumed, as is typical in the literature, though companies may have multiple objectives and could possibly benefit from decen-

tralization. Each affiliate pays corporate income taxes in its resident country calculated at a corporate tax rate t_i. In addition, a tariff is charged by customs in the host country, at a rate τ, on the import of the intermediate goods. The after-tax global profits of the multinational company are expressed as the sum of profits earned in the two countries:

$$\Pi = \begin{pmatrix} (1-t_h)(\bar{\theta}-c_h)+ \\ (1-t_f) \\ (p(q)-(1+\tau)\bar{\theta}-c) \end{pmatrix} q \quad (1)$$

The first-order condition (which is also a sufficient condition) provides the familiar, but slightly modified, relationship with the after-tax marginal revenue equated to the after-tax marginal cost at the group level:

$$(1-t_h)(\bar{\theta}-c_h)+ (1-t_f) \left(\frac{dp}{dq}q + p - (1+\tau)\bar{\theta} - c_f\right) = 0 \quad (2)$$

Domestic Monopoly

A domestic company imports intermediate goods from foreign companies in developed countries and manufactures them with non-differentiated parts, which are purchased from small-sized domestic companies. Final goods are sold at the developing country's local market, where the company has a monopoly on its goods. The manufacturing process arises when the company does not have the know-how to produce intermediate goods. This situation applies to many developing countries, where quality control does not work at the local level. The lack of quality control is due to the unskilled labor force and high costs of training local persons on advanced technology (JETRO, 1997).

The domestic company has the same technology structure as the multinational company. Consumers in the developing country have the same preferences for final goods produced either by the domestic or multinational company. These assumptions imply that both the multinational and the domestic companies produce identical final goods and eliminate the possibilities that the different quality of final goods affects the size of the markets. In the model, the strategic decision-making about the quantity of output (and, thus, the volume of trade) is the only difference between the multinational company and the domestic company. This simplification allows for insight into the impacts of two industrial policies on the size of the market by focusing on their different trade patterns.

The after-tax profit of the domestic company is a standard monopoly problem:

$$\Pi = (1-t_f)(p(q)-(1+\tau)\bar{\theta}-c_f)q \quad (3)$$

The first-order condition (which is also a sufficient condition) provides the familiar relationship of marginal revenue equal to marginal cost:

$$\frac{dp}{dq}q + p(q) = (1+\tau)\bar{\theta} + c_f \quad (4)$$

Globalization for Development?

This section examines the effects of an open-door industrial policy on the size of the markets in developing countries. If the markets between a developed country and a developing country are interrelated through the trade of a multinational company, comparison of the two cases above reveals that the market is enlarged via increased trade volume. The result agrees with the recognized linkage between trade openness and economic growth. In addition, the result provides a theoretical foundation for the claim that international trade initiated by multinational companies has the potential to improve the economic performance of developing countries.

Theorem: A foreign-owned monopolistic

multinational company increases the size of the market in the host country to a greater extent than would the trade of a domestic company with monopoly power.

Proof: Appendix.

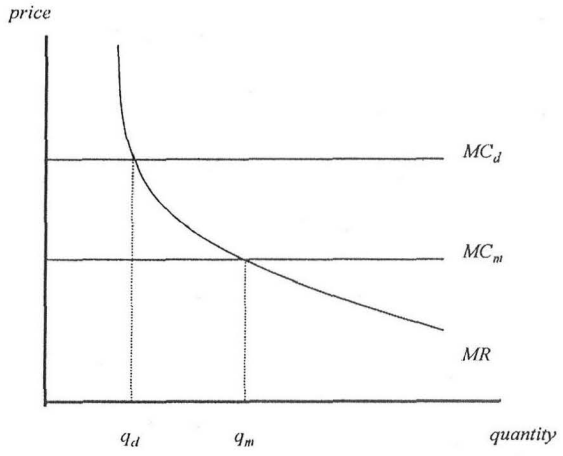
When the markets between a developed country and a developing country are interrelated through the trade of a multinational company, the size of the market in the developing country is enhanced through an increase in the volume of trade across the two countries. The reason for this is the self-interest of the multinational company. The company tries to maximize its global profits by exporting more goods to the host country. More formally, maximizing global profits requires a larger amount of output than maximizing the profit of an affiliate in the host country. One can easily understand the claim because the profit in the home country is monotonically increasing in output (or the volume of trade). On the other hand, as established previously, the condition of profit maximization for the domestic company is the same as profit maximizing condition for the multinational affiliate in the host country. It is concluded that, due to the presence of the foreign multinational company, the market expands relative to its size when there is only the domestic company.

An important point to note is that a multinational company enhances the size of the market by providing the same quality of goods at a lower price than a domestic company (see Figure). Thus, the presence of multinational companies creates new demand for the goods in the local markets of developing countries. Consumers whose reservation price was initially below the price offered by the domestic company, yet equal to or above the price charged by the multinational company, are now able to purchase the good. Such an increase in demand may have a further desirable impact on the economy of these countries via the multiplier effects of consumption. This effect will be larger than the model predicts if more realistic assumptions are introduced. For example, multinational companies have some technological and management advantages compared to domestic companies and, thus, can provide better quality of products at lower prices.

One may wonder whether the result is related to the classic double marginalization argument. Each unit of output sold in the developing country is produced from a unit of input produced in the developed country. The domestic company imports those inputs at the arm's length price and operates as a monopolist in the market. It seems possible that the result in this article could be interpreted as an efficiency loss due to the monopoly mark-up of the domestic company; however, the mechanism is not exactly the same. The multinational company in this model is also segregated into two affiliates under the current jurisdictional tax system. The company purchases intermediate products at the same price as the domestic company and is not able to internalize the cost of intra-firm transactions.[3] Rather, the cause of the enlarged market is due to the self-interest of multinational companies. Since the multinational company is a producer of the input (and the output), producing and exporting more intermediate goods contributes to maximizing its global profits. This is not the case for the domestic company.

Although the multinational company is motivated to export more goods, dumping is not the cause of the enlarged market in the developing country. This is because tax regulations (i.e., BAPA) prevent the multinational company from selling its goods below the actual cost in the current model. Remember how the set-up of the mark-up ratio, k. The enlarged market is obtained solely from the self-interest of the multinational company maximizing global profits. This argument will

Figure
Production Decisions of Companies



MR : the marginal revenue of a domestic company
MC_d : the marginal cost of a domestic company
MC_m : the adjusted after-tax marginal cost of a multinational company*
q_d : the optimal level of the market for a domestic company
q_m : the optimal level of the market for a multinational company

*The first-order condition of a multinational company:

$$(1-t_h)\bar{\theta}+(1-t_f)\left(\frac{dp}{dq}q+p\right)=(1-t_h)c_h+(1-t_f)\left((1+\tau)\bar{\theta}+c_f\right).$$

After-tax marginal revenue = After-tax marginal cost.

To make the comparison easier, rearrange it as

$$\frac{dp}{dq}q+p=(1+\tau)\bar{\theta}+c_f-\rho(\bar{\theta}-c_h),\ \text{where}\ \rho=\frac{1-t_h}{1-t_f}>0.$$

Denote the right-hand side of the equation as

$$MC_m=(1+\tau)\bar{\theta}+c_f-\rho(\bar{\theta}-c_h).$$

become clearer when dumping is discussed.

One final remark is that inward FDI is not a unique solution. The analysis implies that the size of the market in developing countries will increase when the markets across host and home countries are interrelated by the intra-firm trade of multinational companies. Theoretically, outward FDI could achieve the same goal. A domestic company could acquire a foreign input supplier and vertically integrate its business backward; however, this is seldom observed in developing countries.

Applications

This section considers two different scenarios. They are related to the issues of double marginalization and dumping. Although the two issues often concern scholars, they are not realistic given current tax and trade regulations. In both cases, either the developing host country or the developed country is not able to raise tax revenue. This is because the two scenarios do not allocate a positive profit of the multinational company to both

countries. Furthermore, dumping is strictly regulated under trade policy; however, the following discussion reveals that the result is not specific to the situation in the previous section and is still valid in other cases.

Double marginalization. Suppose a single supplier in an upstream location produces intermediate goods and sells them to a single retailer in a downstream location. The retailer sells final goods. The upstream supplier and the downstream retailer each have monopoly power. The price of the final products includes two successive mark-ups (or marginalization). The supplier charges a mark-up when selling the intermediate goods to the retailer and the retailer charges another mark-up when selling the final goods to consumers. This is called double marginalization. Once the two companies integrate their businesses vertically, the mark-up charged by the supplier disappears. A vertically-integrated monopoly enhances the size of the market allows consumers to purchase a larger quantity at a lower price.

The story is about two domestic companies; however, it is possible to extend the argument to the situation in which two affiliates of a multinational company reside in different countries. The upstream supplier corresponds to the parent company in the developed country and the retailer in the downstream location to the subsidiary in the developing country. The situation in which the mark-up charged by the parent disappears is modeled as $k = 0$. After following a similar discussion as in the proof of *Theorem*, the conclusion reached is the multinational company regime attains a larger market size in the developing country than the domestic company regime (see Appendix). The result is intuitive since $k = 0$ is the special case of *Theorem*.

Dumping. "Under international law, a firm is dumping if it sells its product abroad at a price below its domestic price or below its actual costs" (Carlton & Perloff, 1994, p. 758). For example, if the parent exports the intermediate goods to the subsidiary at $25,000 per unit, but non-related parties conduct a similar transaction at $30,000 per unit (this is called a comparable transaction), the multinational company is said to be dumping.

It is reasonable to believe that dumping enhances the size of the market in the developing country. This is because the subsidiary can import the intermediate goods at a lower cost; however, the story is not so simple. It is necessary to distinguish the two cases. Denote the mark-up ratio when the multinational company is dumping as k_d. One is modeled as the case, $0 < k_d < k$, and the other is as the case, $-1 < k_d < 0$. In the former case, *Theorem* derived in the previous section is always valid (see Appendix), but the latter case is slightly complicated. Suppose the parent company in the developed country exports the intermediate goods at a price below marginal cost. The output decision of the company is affected by the trade-off effect between the gain from saving tariff payment and the loss from the decrease in the parent's profit. *Theorem* is still valid, if the corporate tax rate in the developing country is lower than the one in the developed country. This is because, roughly speaking, the gain and loss are weighted by the two tax rates respectively (see Appendix). In reality, observed corporate tax rates in developing countries are much lower than the ones in developed countries (e.g., KPMG, 1998). Given the current tax rates, hosting multinational companies would benefit developing countries via enhanced market size.

Market size and mark-up ratio. Three cases are considered: BAPA ($k > 0$), vertical integration ($k = 0$), and dumping ($0 < k_d < k$ or $-1 < k_d < 0$). The analysis shows that, in all three cases, hosting a multinational company would yield greater benefit to consumers in the developing country than would promotion of a domestic company. One may wonder whether there is any relationship between

market size and the mark-up ratio, k. Suppose the developing country levies a lower tax rate than the developed country. The size of the market increases if the multinational company charges a lower transfer price. The result shows that companies use dumping as a strategy to increase sales in host countries.

Proposition. Suppose the tax rate in the developing country, t_l, is smaller than the one in developed country, t_h. A larger market size, q, is attained with a lower mark-up ratio, k.

Proof: Appendix.

Concluding Remarks

This article illustrates that foreign direct investment by multinational companies, rather than protection of an infant domestic company, yields a larger market and, therefore, fosters growth. The analysis shows that, if the markets between a developed and a developing country are interrelated through the intra-firm trade of a multinational company, the size of the domestic market expands through increased trade volume because the multi-national company tries to maximize its global profits by exporting more goods to the developing country. Therefore, the multinational company can provide final goods to local consumers at a lower price than the domestic company. This creates new demand for the goods in the local markets. These results are also valid in other scenarios.

The current analysis provides a theoretical foundation to the multinational enterprise (MNE) network hypothesis. The MNE hypothesis claims that "increasing imported inputs are related to growing inward FDI; higher input imports would result from intense trading between MNE's affiliates in foreign countries and (parent) companies of the home country" (OECD, 2002, p.80). This article extends the idea and shows that higher input imports by multinational companies have the potential to enhance the host markets. This will benefit local consumers in developing countries.

The analytical framework is applicable to other interesting but more complicated situations. One possible extension is to examine the impacts of the two industrial policies on profits and tax revenues. Sizable tax revenues are often needed to finance social policies in developing countries, where large-scale companies play a dominant role in the economy. Raising tax revenues is an important policy concern of governments in those countries. Other possible extensions are to include exchange rates and foreign tax credits and deductions. Although this requires appropriate modifications to the model, the main conclusion in this article will still hold. The literature such as Baccetta and Wincoop (2000) reports a weak linkage between exchange rate stability and trade. One last extension is to examine the relevance of the analysis using data. An index of ownership-weighted trade openness into the models of previous empirical literatures on a relationship between trade and growth should be introduced. It could be obtained by taking the ratio of the amount of trade conducted by multi-national companies to the amount of trade in the country. Then, trade openness could be multiplied by the ratio. All of these topics represent potential future lines of research.

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Endnotes

1. The model in Elitzur and Mintz (1996) studies an APA case, in which tax authorities in each jurisdiction apply a different arm's length method; however, this may cause international double taxation. To avoid the problem, Tomohara (2004) considers a BAPA case in which two governments and a multinational company agree to a mark-up ratio. Discussion of the BAPA framework is a relevant topic. The number of the applicants to the system in reality is increasing.

2. For example, Honda occupies about 70% of the motorcycle market in Thailand.

3. Tomohara (2004) shows that independent domestic tax policies under the BAPA system cause efficiency losses. BAPAs segregate profits earned by two different affiliates within the same company for the purpose of imposing the tax independently. The degree of the inefficiency increases with a larger mark-up rate. A positive mark-up ratio operates as a proxy of a hazard index that measures the degree under which BAPAs hinder the integration of multinational companies. Inefficiency will be overcome by a zero mark-up ratio.

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Appendix

Proof of Theorem

The result is easily obtained by comparing (2) and (4) as in Figure. First, denote the marginal revenue of the domestic company $MR\left(=\frac{dp}{dq}q+p(q)\right)$ and the marginal cost $MC_d\left(=(1+\tau)\bar{\theta}+c_f\right)$. The optimal level of the market q_d is decided at the point, where MR is equated to MC. Next, to make the comparison easier, rearrange (2) as

$$\frac{dp}{dq}q+p=(1+\tau)\bar{\theta}+c_f-\rho(\bar{\theta}-c_h), \quad \text{where } \rho=\frac{1-t_h}{1-t_f}>0 \qquad (5).$$

The last inequality is obtained from the assumption $1>t_i>0$, where $i\in(h,f)$. Denote the right-hand side of the equation as $MC_m\left(=(1+\tau)\bar{\theta}+c_f-\rho(\bar{\theta}-c_h)\right)$ and the optimal level of the market when a foreign multinational company dominates the market as q_m. With these notations, q_m is decided at the point, where MR is equated to MC_m. Finally, the relationship $q_m>q_d$ is true once we show that the difference between MC_d and MC_m is positive, i.e., $\rho(\bar{\theta}-c_h)>0$. The inequality is always satisfied from the assumption, $\bar{\theta}-c_h=kc_h>0$. ///

Proof of the Statement in Double Marginalization

Substitute $k=0$ into MC_m in the proof of *Theorem*. This makes MC_m to $MC_m^{dm}=(1+\tau)c_h+c_f$ that is smaller than MC_d. ///

Proof of the Statement in Dumping

Denote the right hand side of Equation (5) as $MC_m^d=(1+\tau)(1+k_d)c_h+c_f-\rho k_d c_h$, when the multinational company is dumping. Once we demonstrate that the inequality, $MC_m^d-MC_d<0$, holds, the proof is done. If $0<k_d<k$, $MC_m^d-MC_d$ is always negative since the difference is expressed as $\left((1+\tau)(k_d-k)-\rho k_d\right)c_h$ .///

Show if $0<t_f<t_h$, then $MC_m^d-MC_d<0$ for all k_d such as $-1<k_d<0$. Suppose $MC_m^d-MC_d\geq 0$ for some k_d, then $k_d\geq\frac{k}{1-(\rho/(1+\tau))}$. This implies $(1+\tau)<\rho$ from $k>0$. However, $0<t_f<t_h$ implies $(0<)\rho<1$. Contradiction.///

Proof of Proposition

From Figure, a larger output is attained with a smaller MC_m. If a smaller mark-up ratio reduces MC_m, then the proof is done. Differentiating MC_m with respect to k gives $(1+\tau-\rho)c_h$. This is always positive since $0<t_f<t_h$ implies $(0<)\rho<1$ .///